Fall Risk Based on Timed Up and Go Test in Elderly at Nursing Home in West Java, Indonesia

Thiruchelvam Selvadurai,[1] Tertianto Prabowo,[2] Yuni S.Pratiwi[3]
[1]Faculty of Medicine Universitas Padjadjaran, [2]Department of Physical Medicine and Rehabilitation Faculty of Medicine Universitas Padjadjaran/Dr. Hasan Sadikin General Hospital Bandung, [3]Department of Anatomy, Biology Cell and Physiology Faculty of Medicine Universitas Padjadjaran

Abstract

Background: Falls are major cause of morbidity and mortality in elderly patients. Mobility assessment is important in preventing falls in elderly. This study was conducted to determine the level of fall risk in elderly people at Karitas Cimahi Nursing Home, West Java, Indonesia by using 'timed up and go test'(TUG).

Methods:This cross-sectional descriptive study was conducted at Karitas Cimahi Nursing Home from June–November 2013. The risk of falls was categorized into two; high and low risk of falls. High risk of falls indicated when the participants complete the TUG test with time taken >10 seconds, and low risk of falls indicated when the time taken is <10 seconds. To identify the level of fall risk in elderly people the test which is recommended by the American Geriatric Society was used. The sampling technique used was total sampling. Data was analyzed and presented by using frequency tables.

Results: From a total of 32 elderly population at Karitas Cimahi Nursing Home, a total of 20 participated in this study. The 'Timed up and go test' result for all the participants were >10 seconds.

Conclusions: The level of fall risk in elderly people at Karitas Cimahi Nursing Home based on the test showed that all participants, both male and female, regardless of using assistive device have high level risk of falls. **[AMJ.2017;4(1):83–6]**

Keywords: Elderly, risk of falls, 'timed up and go test'

Introduction

An increasing number of elderly occurred worldwide as a part of health improvement impact. Statistics showed that there were estimated 35 million people aged 65 and above in the year 2000. This number is estimated to increase to 70 million in the year 2030. The group of frail elderly people is the most vulnerable and also causes the most expenses for treatment, medication, long term care and medical illness. These are also the main causes which lead many researchers to carry out ample of studies to enhance the quality of healthy life among elderly people.[1]

The most common reason that causes injury to elderly individuals are falls.[2] Every year one out of three elderly aged 65 and above falls while elderly above 80 years old falls one out of two.[3]

Furthermore, a frequently used tool is the timed up and go test (TUG), which is recommended by the American Geriatrics Society to do screening for risk of falling.[4] A lower cut off point of 10 seconds is the best time which have predictive value of sensitivity 71% and specificity 86%.[5] This test has a meaningful information for further care management especially in community dwelling or residential care facilities.

The main purpose of this study was to identify the level of fall risk among elderly people at Karitas Cimahi Nursing Home based on TUG.

Methods

A descriptive cross-sectional study was carried out at Karitas Cimahi Nursing Home, Indonesia from June–November 2013. Primary data collection was done by total sampling from elderly people who lived

Correspondence: Thiruchelvam Selvadurai, Faculty of Medicine, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang Km.21, Jatinangor, Sumedang, Indonesia, Phone: +62 87827785882 Email: thiruchelvam2186@hotmail.com

there. The total population at Karitas Cimahi Nursing Home was 32 participants and out of that only 20 participants could fulfill the inclusion and exclusion criteria of the study. The inclusion criteria of this study was participants regardless of male or female who were 60 years old and above without any physical injuries. The exclusion criteria were any elderly subject who could not respond to verbal instructions or were unable to walk. This study was approved by the Health Research Ethics Committee of the Faculty of Medicine Universitas Padjadjaran. The participants gave their consent on participation.

All subjects were identified by filling an identity form that had their name, age and gender. Subjects were given adequate explanation about the test and also demonstration by the researcher by performing the TUG test. Participants were allowed to wear glasses if they had visual problems.

In the TUG test, an armchair of standard height was used and a distance of 3 meters was marked with a line of tape on the floor. The starting position was sitting with hands resting on the arms of the chair. The participants crossed the line before turning around and walked back to sit in the chair again. They were instructed to perform the TUG test at their normal speed and they performed one trial before they were timed. The timing of the TUG test started when the participant got up from the chair and stopped when the participant's buttocks touch the seat of the chair again. Throughout the test, local nurses were required to accompany the participants to prevent any complication of falls.

The risk of falls is categorized into high risk of falls which is indicated when the participants complete the test with time taken more than 10 seconds and low risk of falls indicated when the time taken was less than 10 seconds.

The data was collected and analysed using appropriate computer software. The results were shown as the frequency of high risk of falls and frequency of low risk of falls among elderly people in the form of table.

Table 1 Characteristic of Respondents

Characteristic	n(20)
Age	Range Age=62 to 93
Gender	
Male	4
Female	16

Results

The total elderly people population at Karitas Cimahi Nursing Home was 32 people; specifically 8 males and 24 females. Out of 32 participants only 20 fulfilled the inclusion and exclusion criteria. From these 20 participants, 4 of them were males and 16 were females.

Table 2 TUG Test Result

Gender	TUG Score (Second)	Level of Risk	
		High Risk	Low Risk
Male	16.61	4	0
Female	24.47	16	0
Total		20	0

Note: TUG = Timed Up and Go

Table 3 TUG Test Results with and without Using Assistive Device

	Assistive device	TUG Score (Seconds)	Risk Fall Classification
Male	Using=0		High risk
	Not Using=4	16.61	
Female	Using=2	63.26	High risk
	Not Using=14	18.93	

Note: TUG = Timed Up and Go

All participants were found to be having risk of falls with mean TUG score >10 seconds regardless of their gender. Female participants showed higher risk of falls compared to male (Table 2).

Participants who use an assistive device to walk had a higher risk than those didn't use the assistive device. There was a prominent difference in the time taken for participants from the same gender but using an assistive device (Table 3).

Discussion

The characteristics of the risk of fall in elderly people at Karitas Cimahi Nursing Home based on TUG test showed that all participants had high risk of falls.

There were several factors that might influence this result outcome in Karitas Cimahi Nursing Home. Firstly, the average age group of elderly who lives here was 75.1. Risk of falls increases with increase of aging, thus most of the participants in this study had higher risk of falls. Falls is a main problem in elderly people especially in women.[6] In this Karitas Cimahi Nursing Home most of the elderly were females, thus this age group had higher risk of falls. Furthermore, there was lack of physical activities in this nursing home because there was no routine exercise program other than outdoor activities such as sunbathing. Most of the time, the elderly people would be doing their routine activities while sitting, not moving around. This showed that most of the elderly here had less mobility, which contributed to higher risk of falls.

Physical activities will increase the muscle strength which are also important to maintain a proper gait and balance of an individual. Reduction in muscle strength will eventually leads to poor daily living activity, decrease physical strength and prominent disturbance of good quality of life of elderly people.[7] Thus, decreased muscle strength and problem in gait and balance result in high risk of falls. Furthermore, disorders of gait and balance contributes about 3 times the risk of falling.[8] The time taken to heal from fall related injury is long, especially for elderly people who will experience prolonged immobility.[9]

Nutritional factors also contributes to the high risk of falls here. Most of the meals for the elderly here were normal food such as rice, chicken and vegetables. These meals excluded milk or special formulated milk which contains vitamin D or calcium which is essential for strengthening the bone in elderly people's body. At this nursing home a medical check up was performed every once in a month by local doctors and nurses. The check up only included taking blood pressure, pulse rate, blood sugar level, cholesterol and also dental check ups. Special health care checkups namely for falls risk, gait and balance, and muscle strength, were given less priority. For those who were using assistive walking devices, the devices must be bought by some elderly people themselves here and some were sponsored.

Thus, all these factors contributed to the high risk of falls among elderly people at Karitas Cimahi Nursing Home. In this study, it showed that even if the participant was older than the others, his or her TUG score did not indicate that the higher the age, the higher the TUG score.

Falls is the main reason for high mortality and morbidity in elderly people.[1] A study stated that an enviromental hazard, tripping over an object and fall records the highest cause for falling, followed by slipping.[3] The elderly people who are staying at a nursing home have prevalence of falls more than those who are living with communitee.[10] In a previous study, it is stated that elderly people staying in residential care facilities are often frail because of multiple causes such as intake of medicines, lack of muscle strength, susceptible to sickness which contributes to unstability and falls.[3] Although risk of falls increase with age but this statement can be argued because the risk of falls also depends on many other factors for example such as genetic, environment, nutritional status, and many more.

Overall from this study, all the participants had risk of falls at Karitas Cimahi Nursing Home. It is therefore suggested that the management of this nursing home should give more importance in preventing the incidence of falls among the elderly. This nursing home should also make sure that elderly people were given opportunity to do sufficient and pertinent exercise at least for approximately 30 minutes for daily basis. This will increase the muscle strength and increase bone mass thus preventing falls. Thorough check up for visual function should also be performed regularly for the elderly at this nursing home. For example, check for the presence of cataract, glaucoma, regular check up with ophtalmologist is essential as it can prevent the incidence of falls.

The management of Karitas Cimahi Nursing Home should be aware of environmental

hazards. The elderly's daily living space should be safe. It should have good lighting and substantial grab bars. Slippery carpet should be avoided and the bathroom should have non-skid mats and raised toilet seat. This recorded information will be beneficial for the upcoming researchers who will conduct further studies at Karitas Cimahi Nursing Home.

The limitation of this study is that the population was only from one elderly nursing home, thus it could not represent the total elderly population of Indonesia. For further analysis the risk of falls of the individual elderly in this nursing home, upcoming researchers should conduct a cohort study so that the individual at risk of falls can be followed up for a long period of time. This study concludes that all the subjects in Karitas Cimahi Nursing Home have high risk of falls so the recommendation is more studies should be conducted at many other nursing homes (Panti Jompo) so that we can identify the individual with high risk of falls and prevent the incidence of falls.

References

1. Christine C, Rosanne L, Harvey C, Eric LB, Diane ME, Carol CF, Geriatric Medicine 4th ed. New York: Springer-Verlag New York Inc; 2003. p. 45
2. Nordin E, Lindelof N, Rosendahl E, Jensen J, Lillemor OL. Prognostic validity of the Timed Up and Go Test, a modified Get-up and Go test, staff's global judgment and fall history in evaluating fall risk in residential care facilities. Age Ageing. 2008;37(4):442–8
3. Arnold CM, Faulkner RA. The history of falls and the association of the timed up and go test to falls and near-falls in older adults with hip osteoarthritis. BMC Geriatr. 2007;7:17
4. Nordin E, Rosendahl E, Lundin-olsson L. Timed ''up and go" test: reliability in focus on cognitive state in older people. Phys Ther. 2006;86 (5):646–55.
5. Whitney JC, Lord SR, Close JL. Streamlining assessment and intervention in a falls clinic using the Timed Up and Go Test and Physiological Profile Assessments. Age Ageing. 2005;34(6):567–71.
6. Dennis LK, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson JL. Harrison internal medicine book. 16th ed. New York: Mc Graw-Hill companies; 2005. p.50
7. Yoon JE, Lee SM, Lim HS, Kim TH, Jeon JK, Mun MH. The effects of cognitive activity combined with active extremity exercise on balance, walking activity, memory level and quality of life of an older adult sample with dementia. J Phys Ther Sci. 2013;25(12):1601–4.
8. Rubenstein LZ. Falls in elderly people: epidemiology, risk factor and Strategic for prevention. Age Ageing. 2006;35 (Suppl 2):ii37–41.
9. Delbaere K, Bourgois J, Noortgate VDN, Vanderstraeten G, Willems T, Cambier D. A home-based multidimensional exercise program reduced physical impairment and fear of falling. Acta Clin Belg. 2006;61(6):340– 50.
10. Faisal WA, Beattie L, Fu H, James K, Kalula S, Krishnaswamy B, et al. WHO global report on falls prevention in older age. France: World Health Organization. 2007. p.1